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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/252,514

02/18/1999

MAHALINGAM NANDAKUMAR

TI-23103

4595

23494

7590

02/26/2003

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EXAMINER

CRANE, SARA W

ART UNIT

PAPER NUMBER

2811

DATE MAILED: 02/26/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	09/252,514	NANDAKUMAR ET AL. <i>W</i>	
	Examiner	Art Unit	
	Sara W. Crane	2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 18 April 2002.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                             | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

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The amendment filed 18 Aprils 2002 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

source/drain regions 34 formed around source/drain pockets 32 (The original disclosure and figure 1E teach the source/drain regions 34 formed within the pockets 32.)

source/drain regions 34 implanted with an n-type material such as arsenic (The original disclosure teaches source/drain pockets 32 implanted with arsenic.)

source/drain pockets 32 extending within source/drain regions 34 (The original disclosure and figure 1E teach regions 34 within pockets 32.)

source/drain regions 32 adjoining the channel region 24 (The original disclosure teaches that the pockets 32 adjoin the channel region.)

Applicant is required to cancel the new matter in the reply to this Office Action.

Claims 1 and 3-17 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The specification as originally filed does not teach any dopant type for the source/drain regions. Claim language specifying a dopant type for the source or the drain region is therefore new matter.

The "counterdoped region of opposite conductivity type disposed within said source and within said drain and isolated from the remaining portion of said region of semiconductor material by said source and drain" is new matter. No such isolation by source and drain is taught in the original disclosure.

The "second doped region . . . having a greater charge-carrier mobility than said first region" is new matter. The specification as originally filed teaches only that the second doped region has a greater charge-carrier mobility than conventional surface channels. (See, for example, page 7, lines 6-7.) The specification does not teach anywhere that the "first region" has the same charge-carrier mobility as a conventional surface channel.

There is no teaching of the device of claim 9, where a subsurface layer is the primary conduction channel, and at the same time the subsurface layer has a lower concentration of dopant than the overlying layer. The specification does not address the question of the amount of counterdopant to be added to the respective channel regions as claimed, when the subsurface layer is utilized as the primary conduction channel.

Claims 1 and 3-17 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as

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to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

There is no teaching provided to enable one of ordinary skill to make a device having a subsurface doped primary channel layer having a greater charge-carrier mobility than an undoped or doped surface layer. Also, there is no teaching of how to make a MOSFET transistor having source and drain regions of the same conductivity type as the well, and having an oppositely-doped channel. If the source/drain regions are of the same conductivity type as the well, then the source-drain current will simply flow under the oppositely-doped channel layers, through the well.

### ***Conclusion***

Applicant's arguments filed 5 November 2001 have been fully considered but they are not persuasive. Applicant quotes sentences from the specification stating that the subsurface channel layer has a greater charge-carrier mobility than conventional surface channels. The claim language does not say anything about the charge-carrier mobility of conventional surface channels. The claim language refers to the charge-carrier mobility of the "first region" of the device. Applicant notes that the "first region" of the device is a surface channel. The specification does not refer to this surface channel as "conventional," however, and there is no teaching anywhere that the mobility of the first region is the same as the mobility of a "conventional" surface channel device.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to S. Crane, whose telephone number is (703) 308-4894.

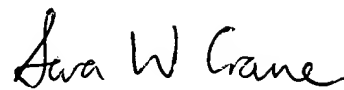
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The fax phone number for this Group is (703) 308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist, whose telephone number is (703) 308-0956.

A handwritten signature in black ink that reads "Sara W. Crane". The signature is written in a cursive style with a large, looped "S" and a distinct "W".

Sara W. Crane  
Primary Examiner  
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